Brief Communication

Intestinal Obstruction Mimicking Acute Myocardial Infarction

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A 64-year-old woman presented at our institution with abdominal pain. An electrocardiogram suggested the possibility of acute anteroseptal myocardial infarction. Her medical history included esophageal reconstruction with use of a jejunal conduit in the anterior mediastinum.

Echocardiography revealed a distended jejunal conduit, which was compressing the right ventricle. Once the cause was identified, nasogastric suction was initiated and the symptoms and electrocardiographic changes resolved. ***(Tex Heart Inst J 2003;30:155-7)***

In September 1998, a 64-year-old woman was admitted to the surgical department with severe chest pain 6 hours after an attempted endoscopic esophageal dilation due to radiation-induced esophageal stricture. An essentially normal electrocardiogram at that time revealed sinus rhythm and a normal QRS axis, with an isolated premature ventricular contraction. Her relevant medical history included squamous cell carcinoma of the larynx treated with laryngectomy and external beam radiation 13 years earlier.

Surgical exploration revealed a small esophageal rupture and a tracheo–esophageal fistula, which were repaired. Feedings were initiated through a gastrostomy tube. Unsuccessful attempts to repair the esophagus led to a total esophagectomy. A portion of the jejunum was placed in the anterior mediastinum to connect the proximal esophagus to the stomach. A postoperative electrocardiogram (ECG) revealed sinus rhythm. However, the appearance of the QRS axis had changed to a pattern of left anterior fascicular block (LAFB), and low voltage was noted (Fig. 1A) due to the placement of a portion of jejunum in the anterior mediastinum.

Nine months later, the patient presented with abdominal pain, nausea, vomiting, and low-grade fever. There were no signs of intestinal obstruction on initial physical exam or radiography. Results of an ECG were unremarkable except for the persistence of LAFB. The patient was treated and released, only to return 2 days later with worsening symptoms. A repeat ECG revealed sinus rhythm, right atrial enlargement, LAFB, and ST segment elevation in leads V_1–V_3 (Fig. 1B), which suggested an acute anteroseptal myocardial infarction. An urgent cardiology consultation was requested to determine whether immediate coronary angiography should be performed. The cardiologist suspected an alternative diagnosis because of the unusual ECG findings (including new right atrial enlargement) and the lack of clinical findings such as chest pain. An emergent echocardiogram showed normal left ventricular function without regional wall motion abnormality. The jejunal bypass occupying the anterior mediastinum was fluid filled and distended, causing substantial right atrial and ventricular compression (Fig. 2), which seemed to explain the ECG changes.

Results of routine laboratory tests, including electrolytes, were normal. Repeat abdominal radiographs were consistent with partial small bowel obstruction (Fig. 3). The patient was treated with nasogastric suction, upon which her symptoms and ECG changes (right atrial enlargement and ST elevation) quickly resolved (Fig. 1C). Results of serum troponin and creatine kinase MB isoenzyme tests were negative. When last seen in September 2002, the patient continued to do well, without further episodes of chest pain or intestinal obstruction.

Key words:
Echocardiography; electrocardiography; esophagectomy; intestinal obstruction; myocardial infarction

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Discussion

This case illustrates the variations that can be seen on a surface ECG after a change in the configuration of intrathoracic contents. Intrathoracic pathologic processes and surgical interventions may cause a shift in the mean QRS axis due to displacement of the heart by a space-occupying mass, or may produce changes in voltage due either to the movement of the heart in the anterior–posterior plane or to a change in the type or quantity of tissue between the chest wall and the heart. In our patient, compression of the anterior surface of the heart (right atrium and ventricle), and possibly of the right ventricular marginal branches, created an injury pattern in the right precordial leads that could easily have been mistaken for an acute anteroseptal myocardial infarction resulting from coronary artery thrombotic occlusion. One unexpected finding was that of right atrial enlargement, which is not generally seen in cases of anteroseptal infarction.

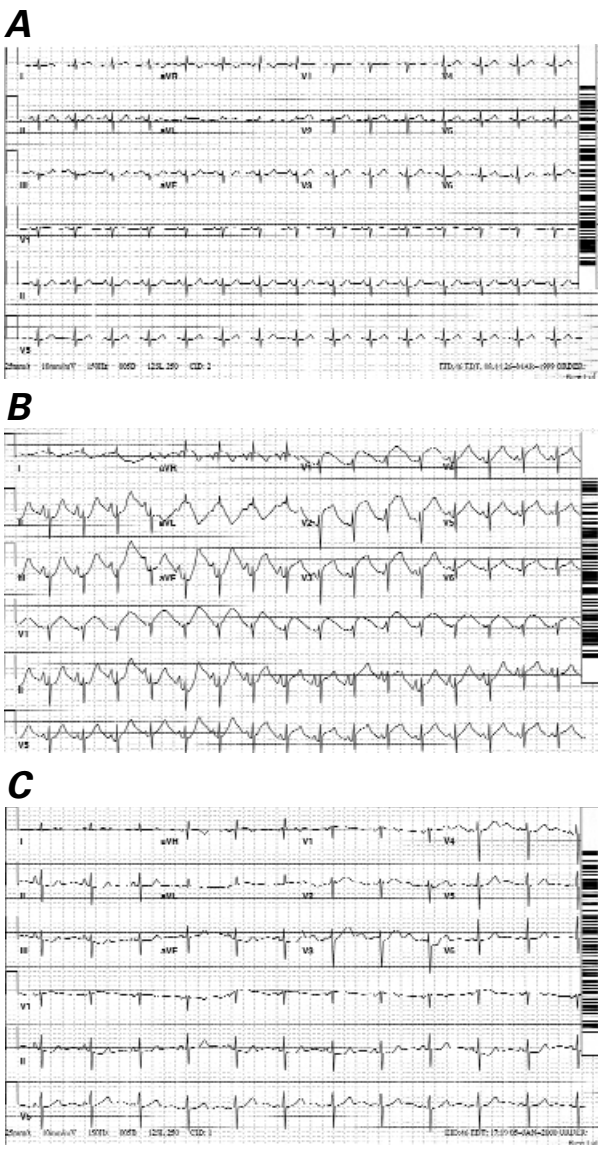

Fig. 1 ***A****) Baseline electrocardiogram (ECG) after placement of a jejunal bypass in the anterior mediastinum shows sinus rhythm and left anterior fascicular block.* ***B****) An ECG at the time of intestinal obstruction shows ST segment elevation in leads V_1–V_3 and evidence of right atrial enlargement.* ***C****) An ECG after initiation of nasogastric suctioning shows a return to baseline.*

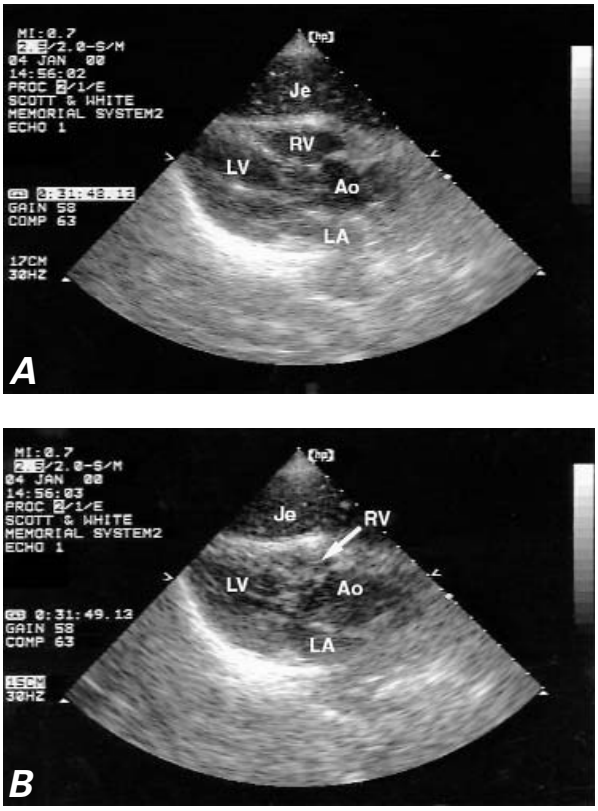

Fig. 2 *Transthoracic echocardiogram in a parasternal long-axis view shows* ***A****) diastolic and* ***B****) systolic still frames.*

Ao = aortic root; Je = jejunal bypass; LA = left atrium; LV = left ventricle; RV = right ventricle

This ECG pattern of ST segment elevation in leads V_1–V_3 (Fig. 1B) is well described in cases of right ventricular infarction, myocardial contusion due to nonpenetrating trauma,[1] and acute cor pulmonale such as that resulting from pulmonary embolus.[2] These 3 diagnoses can be accompanied by right atrial enlargement; however, the absence of chest pain, jugular venous pressure elevation, and hemodynamic changes would argue against right ventricular infarction. Our patient had no history to suggest myocardial contusion; moreover, the absence of tachypnea, chest pain, hypoxia, and deep vein thrombosis made the diagnosis of pulmonary embolus unlikely. Other diagnoses to consider in such a patient include localized or global pericarditis (note the suggestion of PR segment depression in leads II, III, and aVF), electrolyte derangements (which could be supported by the diffuse ST

segment changes and prolonged QT interval), and hypothermia.

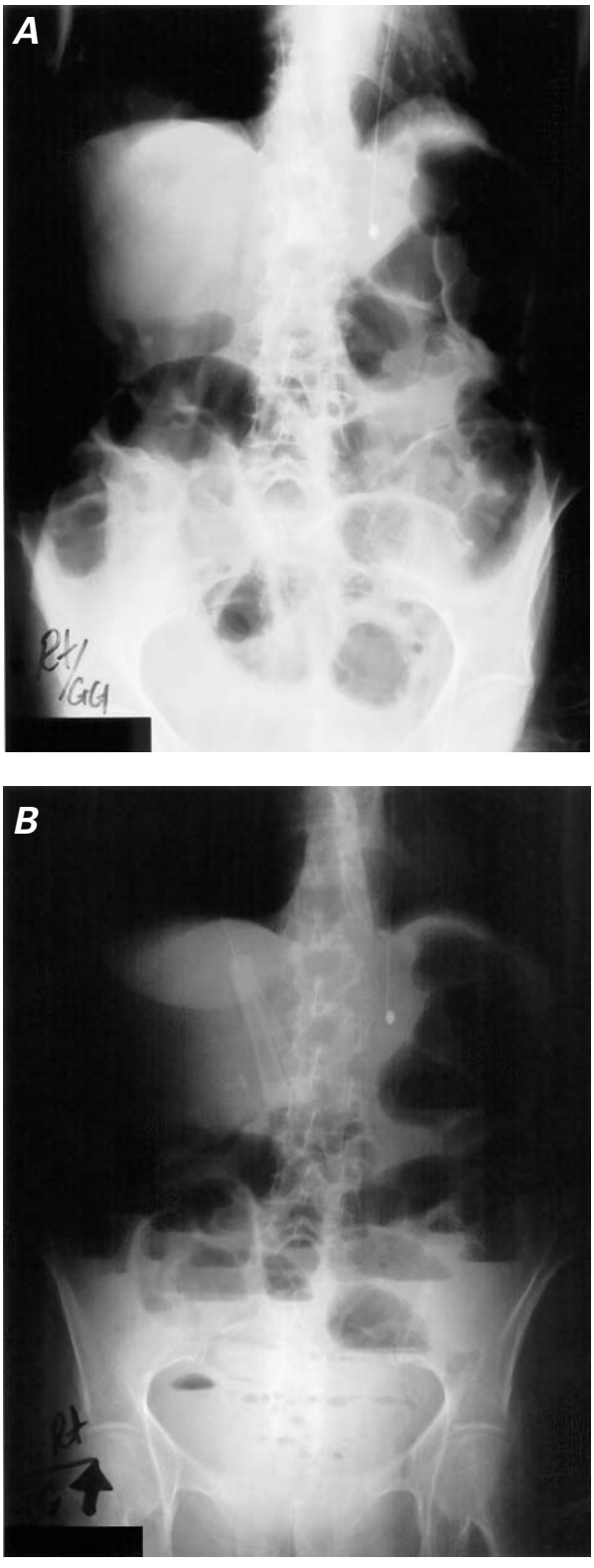

Fig. 3 *Abdominal radiographs with the patient in the* ***A****) supine and* ***B****) upright position show differential air–fluid levels consistent with small bowel obstruction.*

In conclusion, we present an unusual cause of epigastric pain and ECG changes that mimicked acute myocardial infarction. On the basis of clinical suspicion, bedside echocardiography was performed, which revealed right atrial and ventricular compression, a large fluid-filled mass, and normal left ventricular wall motion. After the diagnosis was established, appropriate measures were taken, and the symptoms and the ECG changes resolved.

References

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